

## CARBON-NEUTRAL SEATTLE

## ENERGY OF THE BUILT ENVIRONMENT

**WHY.****Jobs, durable economic prosperity and pride in Seattle identity:**

Seattle already has tremendous cultural investment and cutting-edge expertise in the mission and mobilization of sustainability. Now we can build durable prosperity with an economy that walks that talk. It's a matter of Seattle jobs, vibrant growth at the vanguard of the global clean-economy transformation, and of a deep and durable pride in our hometown values and ingenuity.

**WHAT.****Seattle is better than “neutral:”**

By 2030, Seattle will create thousands of jobs in energy-efficient community design, clean generation and cutting-edge energy storage. Measures of success will include profits to our community from exporting clean-energy electrons, technology and expertise in sustainable city design practices.

**By 2030 the City of Seattle will achieve profitable clean-energy export by:**

1. Synchronizing Seattle's Energy Code with 2030 Challenge Targets.
2. Establishing Neighborhood Energy Performance Districts to compete on district-scale energy efficiency and clean energy generation with hyper-local leadership and solutions.

**YES, SEATTLE MUST THINK BIG.**

**Yes, this is bigger than conventional wisdom:** “conventional wisdom” is just for reinforcing the conventional, not inventing the future. We must embrace the big changes outlined above to build deep and durable energy sustainability for Seattle jobs, economic resilience and identity. In that spirit, some big ideas we reject and embrace are:

**We do not accept:**

- That Seattle is sustainable because we already have – and will have in perpetuity – abundant hydroelectricity.
  - Hydro will dwindle with further siltification of our dams, and under the increased sun and decreased rain of climate change.
  - Population, and per capita demand if we continue without efficiency improvements, will increase over time.
  - Fossils are currently the only sources set up to fill the void at scale.
  - Seattle is paying eastern Washington for power, and we lose a great deal of it<sup>1</sup> in the transmission.
- That we don't waste much energy, and that buildings only use electricity.
- That energy efficiency is enough without new, distributed generation of renewable energy and without significant behavior and cultural change.
- That paying to landfill garbage instead of applying it for profitable energy generation is an acceptable use of taxpayer dollars.
- That technology alone – without cultural and behavior change – will save us.
- That “green” always costs more.

- That solar can't work in the Pacific Northwest, especially solar hot water.
- That it's impossible for utilities to profit from energy efficiency.

#### We do believe:

- That the City of Seattle can become a net exporter of renewable energy.
- That recovery and reuse of thermal energy will play a leading role in carbon reduction, and that renewable thermal energy can facilitate "net export" of renewable energy.
- That community energy planning on a "District Scale" can accelerate local action and results.
- That waste-to-energy and combined heat and power generation with natural gas are winning opportunities to divert costly waste into profitable and responsible renewable electricity and heat
- That when transportation moves toward electrification, new electricity must also be generated either from a renewable source or high-efficiency combined heat and power production using the power to fuel the cars and heat to heat the buildings.

#### These aren't just opportunities for the affluent:

This is not a technology problem: solutions are therefore *major job-creators* for the long term (→ Green Jobs, Youth groups)

Community inclusion: (→ Green Jobs, Transportation, Food, Land Use, Youth, Neighborhoods groups)

- Many of the solutions above directly follow the leadership of low-income communities: dense, vibrant neighborhoods; transit-oriented planning; explosive farmers markets, youth engagement
- Disadvantaged communities have the most to gain from deep sustainability solutions
- We can do more good with behavior change than with money: again, this isn't a problem or solution of cost

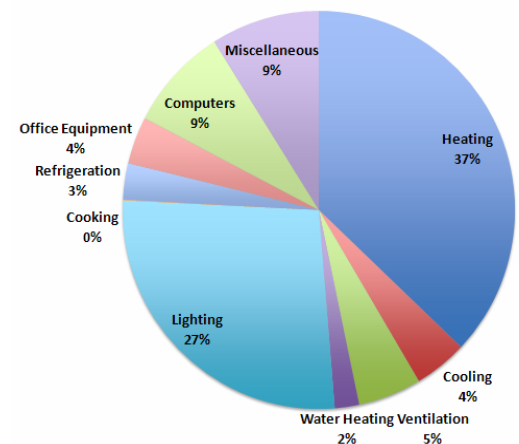
### THE PROBLEM.

We power our lives inefficiently with too much of the wrong fuels for the wrong uses. Our homes and offices are well lit and climate comfortable thanks to electricity, gas and in some cases district energy. But

- We pump a great deal of inefficient energy use into heating, cooling and lighting (e.g., the chart at right).
- Burning gas to make heat is carbon intensive.
- Using electricity for heat or cooling robs electricity from displacing other fossil fuel such as gas and coal-fired generation.

We can maintain or even improve our living standards with far smarter choices about the quantity and type of fuels to power our built environments.

Seattle Office CBECS Load Profile



### THE SOLUTIONS.

Short-term & ongoing Action

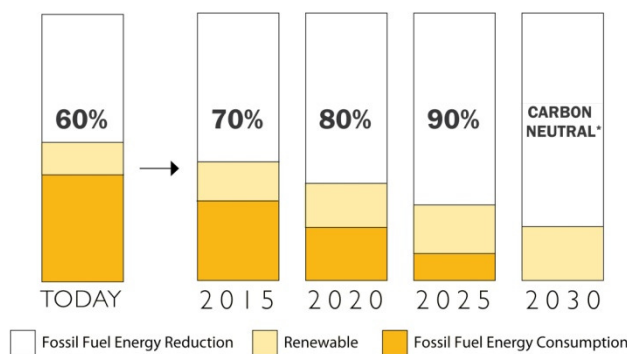
#### 1) Synchronize Seattle Energy Code with 2030 Challenge Targets

Seattle is a signatory to the 2030 Challenge, and Washington State law targets a 70% reduction in building energy use by the year 2031. To ensure that these targets are met:

- Establish a **predictable schedule** for Seattle Energy Code performance upgrades each code cycle for the next 20 years, culminating with net zero energy use in 2030.
- Establish a **single energy modeling software standard**, and require that it be

used for all new construction permits.

- C. **Track the modeled energy use** for Seattle Energy Code-compliant projects to develop appropriate energy use targets for each building type.
- D. Based on the measured energy performance of a number of code-compliant buildings, establish a **performance-based energy code** for new construction to replace the current prescriptive code. (Alteration projects and single-family residential would still follow prescriptive codes.)
- E. **Track the actual energy use** over time (of regulated loads only) to compare with the modeled energy use for each new building. For buildings with regulated loads 20% or more above what's targeted, require re-commissioning every five years, and require all corrections suggested by the commissioning study that have a payback period of two years or less to be completed.



**The 2030 Challenge**

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 \*Using no fossil fuel GHG-emitting energy to operate.

Transition to a performance-based code is essential to achieve such high performance levels, and would allow designers and builders latitude to meet these standards in the most cost-effective manner. Maintaining systems for optimal long-term functioning is essential for the potential energy savings to be realized, and DPD would be the most appropriate enforcement agency for such re-

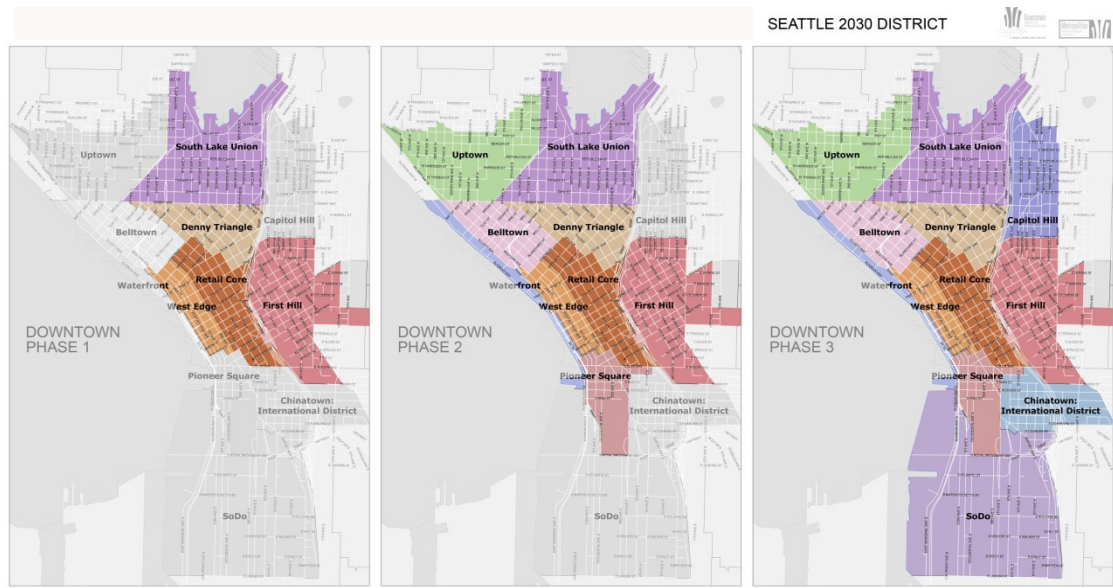
commissioning. There are numerous precedents for periodic inspections of this sort, such as tailpipe testing of vehicles, elevator safety inspections, sprinkler system testing and the like. This proposal exempts buildings whose energy use remains close to the modeled performance.

## 2) Neighborhood Energy Performance Districts (NEPD)

The scale of the built environment's geography as well as the stakeholder leadership necessary to achieve sustainability is at the scale of neighborhood and business districts. The essential and interconnected components of Neighborhood Energy Performance Districts are:

**Short-term Action**

- A. **District conservation and efficiency** is first (though will not achieve Seattle's vision alone). Proven technology exists and is readily available; barriers are financial. The City needs to use its bonding power to provide a tax-exempt, low-interest, revolving source of capital necessary for property owners to invest in upgrades, inherently requiring a great many local jobs. Conservation and efficiency in existing buildings is a first priority, exemplified by pilot models already in existence:



Long-term  
Action

- a. Business and Commercial – the **Seattle 2030 District**<sup>2</sup>
  - b. Residential – **Sustainable Works**<sup>3</sup>
    - Both served by the City with streamlined permitting, City staff support and utility incentives to assist with implementation, performance tracking and re-commissioning every 5 years to operationalize the Disclosure Ordinance.
- B. **District-scale local power generation** should be combined with district energy to capture and re-use waste heat and to develop local, renewable generation. City staff and the private sector are already exploring successful pilot projects.
- a. Deployment of **solar renewables** (photo voltaic and thermal) as utility rates rise and production costs decline.
  - b. **Stop paying to landfill our waste; start profiting by converting waste to energy.** Landfill use is unsustainable and expensive while clean waste-to-energy is a clean, profitable, sustainable energy. Waste-to-energy facilities must use combined heat and power technology to ensure energy is not wasted. Numerous cities around the world already serve as successful examples, including Copenhagen, Malmo and Frankfurt.
- C. **Competition among Neighborhood Energy Performance Districts:** One of Seattle's greatest strengths is our deep-rooted neighborhood culture and identity. Neighborhoods are already demonstrating the leadership for energy consumption audits, strategy sessions with the City and utilities to map local energy sources and uses, and implementation of energy management upgrades – this leadership has enormous potential to grow organically from all of Seattle's neighborhoods with a cohesive City-commissioned competition.

The 2030 District and the Sustainable Works concepts should evolve into a

<sup>2</sup> <http://www.seattle.gov/dpd/News/dpdINFO/default.asp> - July, 2010, page 9

<sup>3</sup> <http://www.sustainableworks.com/>

**Medium-term Action**

competition among all Seattle's neighborhoods contingent upon their own energy consumption profile, geographic orientation, institutional, urbanistic and environmental assets, and grassroots leadership to achieve hyper-local energy sustainability. Neighborhoods that come forward with the best plans to map their energy sources and sinks to generate and use energy in the most efficient way possible will receive City incentives to implement their upgrades.

- a. The City will publicize a scheduled ramp-up of resources for neighborhoods that step up – 1 in the first year, 2 neighborhoods' worth of incentives in the next year, etc. As such, the City can learn to implement the program in manageable stages, and early leaders will serve as pilot projects that can educate new leadership as more neighborhoods organize themselves to participate.
- b. At the City's discretion, incentives can range from better community centers, utility rate cuts for households in participating neighborhoods, etc.
- c. Competition among Neighborhood Energy Performance Districts are a win-win-win: the competition will foster community leadership to build hyper-local sustainability solutions based on the objectives of all of the City Council's research groups and a deep sense of neighborhood pride.

→ With A., B., and C. supported by

**Medium-term Action**

**D. Financing**, using a portfolio of:

- a. Revolving **Municipal Energy Efficiency Bonds**, repaid with utility bill savings.
- b. **Third-Party Financing**, using traditional ESCo (Energy Service Company) models and new off-balance sheet financing pioneered by Equilibrium Capital<sup>4</sup> and others.
- c. **A gradual increase in local energy rates** to motivate and financially justify greater energy savings,
  - i. Implemented either as simple rate increases, or
  - ii. Implemented as a system benefits charge that creates an investment pool for energy efficiency innovation, modeled on the success of the Oregon Energy Trust
- d. City of Seattle support for **statewide carbon tax** revenues.

→ All creating the need for and the community benefits of:

**Long-term Action**

- E. **Training, Education and Jobs** for an economically vibrant Seattle exporting clean energy, expertise and technology. Breaking the design, construction and building operations professions out of old habits and assumptions to approach new problems with fresh attitudes, exemplified by the Seattle AIA+2030<sup>5</sup> series, in its third year and being replicated nationally, and Seattle's Energy Auditor program.<sup>6</sup>

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<sup>4</sup> <http://www.eq-cap.com/>

<sup>5</sup> <http://www.aiaseattle.org/aia2030>

<sup>6</sup> <http://www.seattle.gov/personnel/resources/specifications.asp?schematic=7005004>